

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Amendment of Part 101 of the Commission's)	WT Docket 10-153
Rules to Facilitate the Use of Microwave for)	
Wireless Backhaul and Other Uses and to Provide)	
Additional Flexibility to Broadcast Auxiliary)	
Services and Operational Fixed Microwave)	
Licensees)	
 Request for Interpretation of Section 101.141(a)(3))	WT Docket 09-106
of the Commission's Rules Filed by Alcatel-)	
Lucent, Inc., et al)	
 Petition for Declaratory Ruling Filed by Wireless)	WT Docket 07-121
Strategies, Inc.)	
 Request for Temporary Waiver of Section)	RM-11417
101.141(a)(3) of the Commission's Rules Filed by)	
Fixed Wireless Communications Coalition)	
 To: The Commission		

Reply Comments of EIBASS

Engineers for the Integrity of Broadcast Auxiliary Services Spectrum (EIBASS) hereby respectfully submits its reply comments in the above-captioned Notice of Proposed Rulemaking (NPRM) and Notice of Inquiry (NOI) relating to flexibility for Part 74 Broadcast Auxiliary Services (BAS) stations, and other issues.

I. While It Would Be Best If the Commission Looks to the 7,125–8,500 MHz Federal Microwave Band for Additional Backhaul Spectrum, Allowing POFS Entry to the 7 and 13 GHz TV BAS Bands Is Possible if Certain Safeguards Are Adopted

1. EIBASS agrees with the Society of Broadcast Engineers, Inc. (SBE) that the best solution for additional backhaul spectrum for widely available and cost-effective broadband access for all Americans, a primary goal of the National Broadband Plan, would be to open up the 7,125–8,500 MHz federal government band to Private Operational Fixed Service (POFS) stations, rather than attempting to let newcomer POFS licensees share spectrum with the already

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heavily used 7 and 13 GHz TV Broadcast Auxiliary Services (BAS) bands. However, in the event the Commission deems the 7,125–8,500 MHz band as either not suitable, or insufficient for, new backhaul spectrum needs, then EIBASS is more optimistic than SBE about making such sharing work.

2. But let the record be clear. If a requirement for POFS stations to protect fixed electronic news gathering (ENG) receive-only sites now operating in the 7 and 13 GHz TV BAS bands is not adopted as proposed by EIBASS in its initial comments, then the spectrum train wreck predicted by SBE will most certainly occur.

3. The joint comments of the Association for Maximum Service Television, Inc. (MSTV) and the National Association of Broadcasters (NAB) similarly concluded that if POFS is to be allowed entry to the 7 and 13 GHz TV BAS bands, then mobile TV Pickup operations must be protected. MSTV/NAB propose such protection by (1) making POFS secondary to TV BAS operations, (2) only allowing POFS entry into unspecified subsets of the 7 and 13 GHz TV BAS bands, and (3) protecting not just existing BAS operations, but "also [BAS] licenses that broadcasters may obtain in the future."¹ Obviously, EIBASS agrees that mobile TV Pickup operations must be protected, but disagrees with MSTV/NAB's proposed means to accomplish that protection. Rather than making POFS secondary, or restricting POFS to subsets of the 7 or 13 GHz TV BAS bands, EIBASS believes a better approach is to allow co-primary operation, but require POFS entrants to protect all fixed ENG-RO sites of record at the time the POFS application is filed (subject to a reasonable period in which TV Pickup licensees would be given time to add such fixed ENG-RO sites to their 7 and/or 13 GHz TV Pickup licenses).

4. EIBASS is taken aback, though, by the MSTV/NAB proposal to protect not only existing BAS operations, but also any future BAS operations that a TV station (or other TV BAS eligible entity) might deploy in the future. Protecting unspecified, unknown, future spectrum use to the detriment of users who have an immediate spectrum need is unprecedented, and EIBASS cannot agree to such an approach, any more than it could agree to a proposal by POFS licensees that BAS fixed-links entering the POFS bands would have to protect any future operations by POFS entities. Such secondary status, for either side, would be a "poison pill" against newcomer use of an existing band, and would defeat the whole purpose of the rulemaking, which is to allow the more efficient use of spectrum.

¹ MSTV/NAB comments, at page 8.

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5. Instead, EIBASS suggests the following four criteria for allowing POFS licensees access to the 7 or 13 GHz TV BAS bands:

5A. Fixed-link POFS stations on TV BAS Channels B18, A19, B19, A20 or B20 should be precluded within 50 km of the top-100 TV markets (*i.e.*, the current Section 74.602(a), Note 2, restriction).

5B. Where an SBE BAS frequency coordinator has already coordinated a home channel² for ENG in a specific market, fixed-link POFS stations should be precluded within the operational radius of record of the TV Pickup license for that TV station.

5C. Certain venues known for routinely needing mobile ENG based on previous usage (*e.g.*, racetracks, sports complexes and major sports venues) should similarly have a 50 km radius preclusion circle for the TV BAS channels regularly used at those locations.

5D. Newcomer POFS stations must protect all co-channel or adjacent-channel fixed ENG-RO sites shown in the ULS as associated with any TV Pickup station.

6. EIBASS reiterates that the protection criteria for fixed ENG-RO sites should be the same criteria adopted by the Commission in the ET Docket 00-258 rulemaking, which allowed Department of Defense (DoD) uplinks at up to eleven sites access to the 2 GHz TV BAS band: Namely, no more than a 0.5 dB degradation in the receiver threshold of a receiver installed at a fixed ENG-RO site. EIBASS agrees with the SBE comment that since fixed ENG-RO sites use either directional but remotely steerable receiving antennas that can be aimed in real time at the location of an ENG truck (or other TV BAS signal source) for a particular news event or other changing venue, or arrays of receiving antennas giving near-omnidirectional reception, that demonstrating such protection by a newcomer POFS link will not be easy. EIBASS further notes that there can be no polarization discrimination claim by the POFS link, since ENG operations are typically polarization-agile.

II. The PCN Process Is Not Perfect, But It Works Reasonably Well

7. SBE states that the Part 101 prior coordination notice (PCN) process has not worked well for Part 74 BAS stations³ in the "eight" years⁴ that it has been in effect, and does not apply at all

² Under a "home channel" plan, one or two TV stations in a market are treated as having first use of that channel. Other TV stations in the market, or itinerants visiting the market, can use that channel if they coordinate with the home channel station(s) first.

³ SBE comments, at pages 3 and 10.

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to mobile operations.⁵ While EIBASS agrees that PCNs sent to licensees that are neither co-channel nor adjacent-channel to the recipient's operation, or not in the coordination keyhole of the proposed station are inappropriate, EIBASS does not believe that such "shotgun" PCNs⁶ rise to the level of calling the ET Docket 01-75 decision to subject most Part 74 fixed-link operations to the PCN process a "failure." However, to address this problem to the degree it does exist and creates unnecessary work for PCN recipients, EIBASS suggests that the Commission caution commercial microwave frequency coordinators (CMFCs) that they should refrain from sending a PCN notice to any licensee that is neither co-channel nor adjacent-channel, or has a receive-end site not within the coordination keyhole distance.⁷ As shown by the attached Figure 1, the TSB10-F below-15 GHz and above-15 GHz coordination keyholes are well-defined geometric shapes, and it should not be difficult for a CMFC to do a sort so that only co-channel and adjacent-channel fixed-link stations with receive sites within the pertinent coordination keyhole are notified. Further, in the event that a CMFC continues to send excessively broad PCNs, and a complaint documenting such "shotgun" PCNs is filed with the Commission, the Commission would then of course have the option of taking further action.

8. For BAS links that are subject to the PCN process rather than local coordination by BAS coordinators, EIBASS realizes that some of the more active BAS coordinators wish to receive copies of those PCNs, while other BAS coordinators don't. To this end it would be helpful if PCN notices sent by e-mail have a standardized subject line, to thus allow individual BAS coordinators to auto-file the PCNs, when received.

9. SBE notes that while some CMFCs feel obligated to protect licenses that show up as expired in the Universal Licensing System (ULS)⁸, EIBASS believes that there is a second major reason for the Part 74 difficulty with the PCN process: Missing receive-end data. However, EIBASS will first address the "expired" license problem.

10. At one time, broadcasters holding BAS licenses had to separately renew each such license using FCC Form 313R. Then, at least twenty years ago, the Commission decided that a renewal

⁴ The PCN process for Part 74 BAS stations did not go into effect until October 16, 2003, so the interval has been seven years, not eight years.

⁵ SBE comments, at page 10. EIBASS notes, however that even before the ET Docket 01-75 rulemaking, the PCN process applied to mobile TV BAS operations in the shared 6.5 GHz band; see the November 13, 2002, ET Docket 01-75 R&O, at paragraph 63.

⁶ SBE comments, at page 13.

⁷ As defined in TSB10-F, *Interference Criteria for Microwave Systems*, at Section 3.4. Section 101.105(c) of the FCC rules in turn defines TSB-10F as a "safe harbor" protocol for PCN interference calculations.

⁸ SBE comments, at page 12.

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application for a broadcast station license would also be deemed to be a renewal application for all BAS stations associated with that broadcast station. This, however, resulted in two problems: First, for several years, the Media Bureau was not notifying the Wireless Telecommunications Bureau (WTB) when a broadcast station filed for license renewal, and thus also filed for renewal of its associated BAS licenses. This caused WTB to incorrectly believe that many BAS licenses had been allowed to expire, and incorrectly deleted those licenses from the ULS. EIBASS understands that this miscommunication problem was fixed perhaps ten years ago.

11. However, that still leaves a remaining faux expired license problem: Namely, when the renewal of a broadcast station's license is challenged, thus holding up the renewal grant, apparently WTB is not informed of the delay. Thus, WTB does not receive a timely renewal notification from MB. This results in BAS licenses in the ULS showing up as "expired," when in reality they are not expired. This is because Section 1.62 of the FCC rules states that if a timely renewal application is filed, then a station has continuing authority until such time as the renewal application is acted upon. In the case of a contested renewal of a broadcast license, this can take years. In the mean time, the station's associated BAS licenses are at risk of being inappropriately flagged as expired, or even deleted entirely from the ULS. Thus, CMFCs have good reason to be cautious about not protecting a fixed-link BAS record showing as "expired" in the ULS.

12. To EIBASS, the solution to this problem seems simple enough. Just as the ULS has a "pending application" flag, there should be a "pending (timely) renewal" flag that should prevent a BAS record from showing as "expired," or from being deleted from the ULS. EIBASS respectfully suggests that the Commission also has an obligation to review all broadcast renewal applications delayed by pending license renewal challenges, and ensure that said challenges do not result in the incorrect flagging of the broadcast station's associated BAS licenses as "expired." Or, to cite a more serious consequence, that a renewal challenge could cause a BAS license to be deleted from the ULS. While BAS licenses that have fallen through this crack in the system of course need to be reinstated, it would be better for all concerned if this crack were sealed.

13. The genesis of the missing-receive-end data for fixed-link Part 74 BAS licenses goes back prior to 1974 when FCC Form 313 did not even ask for fixed-link applications to report their receive-end coordinates, let alone the receive-end antenna height and the make/model of the receiving antenna. In the April 4, 2003, SBE request for a one-year delay in the effective date of the PCN protocols for most fixed-link BAS stations, 29.3% of those records had missing or otherwise defective data for the link's receive-end geographic coordinates. In response to this

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SBE filing, on April 15, 2003, the Commission issued an Order, delaying the effective date of the PCN portion of the ET Docket 01-75 R&O until October 16, 2003. The purpose of the stay was to give fixed-link BAS licensees time to add missing receive-end data to their license records, so that CMFCs would be able to properly study, and protect, those stations.

14. Unfortunately, in the intervening seven years the Part 74 fixed-link database integrity in the ULS has not improved all that much, as follows:

Class of fixed-link station ⁹	Percentage with missing/bad RX-end coords	Percentage with missing RX height	Percentage with missing RX antenna make/model
950 MHz Aural BAS	15.1%	35.4%	48.5%
2 GHz TV BAS	8.6	20.6	25.1
2.5 GHz TV BAS	16.2	42.2	68.7
7 GHz TV BAS	15.3	37.3	51.3
13 GHz TV BAS	13.3	35.1	49.8
18 GHz TV BAS	14.8	34.1	55.2

Data provided courtesy of Micronet Communications, Inc., 720 F Avenue, Suite 100, Plano, TX 75074; telephone 972/422-7200, a recognized CMFC: see

http://wireless.fcc.gov/services/index.htm?job=licensing_1&id=microwave .

15. By comparison, POFS fixed-link records, which have used FCC Form 601 (or a predecessor form) that required reporting receive-end data, are in much better shape, as follows:

Class of fixed-link station ¹⁰	Percentage with missing/bad RX-end coords	Percentage with missing RX height	Percentage with missing RX antenna make/model
6 GHz POFS (lower)	0.4%	2.8%	20.7%
6 GHz POFS (upper)	0.2	0.2	32.4
11 GHz POFS	0.3	0.6	5.3
18 GHz POFS	0.4	0.1	6.6

Data again provided courtesy of Micronet Communications, Inc.

⁹ Class AI and AS for 944–952 MHz Aural BAS
Class TI, TS and TT for 2,025–2,110 MHz TV BAS
Class TI, TS and TT for 2,450–2,500 MHz TV BAS (i.e., includes grandfathered TV BAS Channel A10)
Class TI, TS and TT for 6,875–7,125 MHz TV BAS
Class TI, TS and TT for 12,700–13,250 MHz TV BAS
Class TI, TS and TT 17,700–19,700 MHz TV BAS.

¹⁰ Class MG, MW and CF for 5,925–6,425 MHz stations
Class MG, MW and CF for 6,525–6,875 MHz stations
Class MG, MW and CF for 10,700–11,700 MHz stations
Class MG, MW and CF for 17,700–19,700 MHz stations.

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16. Thus, in the event that the Commission does open the 7 or 13 GHz TV BAS bands to POFS, a reasonable amount of time should be allowed to give broadcasters one last chance¹¹ to supply missing receive-end data (and to add fixed ENG-RO receive site data to their 7 and 13 GHz TV Pickup licenses), before allowing POFS to commence PCN studies and, if successful, file applications. However, no such delay would be needed for allowing broadcasters access to the POFS bands, since as shown above the POFS records appear to be in reasonably good shape.

III. Abolishing the No-Last-Link Restriction Would Give Aural BAS Stations Access To Three 900-MHz POFS Bands

17. SBE states that abolishing Section 101.603(a)(7) of the POFS rules, which prohibits a below-21 GHz POFS station from being used as the last link to a broadcast station, is not a sufficient *quid pro quo* for opening up the 7 and 13 GHz TV BAS bands to POFS. EIBASS has to respectfully disagree: Abolishing this rule would additionally give 950 MHz Aural BAS band licensees access to the 932.5–935 MHz; 941.5–944 MHz; and 952–960 MHz POFS bands. EIBASS sees this as a significant opportunity to radio station licensees starved for more 950 MHz Aural BAS spectrum.

18. Like AT&T, EIBASS realizes that having eligibility for potential new spectrum does not necessarily mean that the new spectrum will be actually available. That is, Aural BAS links will have to be able to successfully frequency coordinate in one of the 900 MHz POFS bands; but it appears that elimination of Section 101.603(a)(7) would certainly allow a broadcast radio station licensee to try for a 900-MHz band POFS channel, even if that link would be the final link to a broadcast station. EIBASS acknowledges that any such attempt would have to meet all applicable POFS rules (including bandwidth limitations).

IV. Adaptive Modulation

19. EIBASS notes that several parties, such as the AT&T, National Spectrum Managers Association (NSMA), the Telecommunications Industry Association (TIA), and others, filed in support of allowing adaptive modulation. EIBASS further notes that Comsearch and others

¹¹ EIBASS notes that in the past WTB has issued public notices asking broadcasters to examine their BAS records in the ULS for accuracy, and to ensure that each such record has a proper parent station facility identification number. Nevertheless, some BAS licenses in the ULS continue to be “orphans;” that is, they show no associated parent broadcast station, broadcast network entity, or cable network entity. However, such requests occurred before the 2003 PCN decision. Now that a PCN requirement applies, broadcasters have had a greater incentive to ensure that their BAS licenses in the ULS are up to date. And if BAS licensees do not avail themselves of one more opportunity to bring their fixed-link records up to date, they will suffer the consequences of PCN studies for newcomer POFS stations possibly not giving Part 74 fixed-link stations the protection to which they would otherwise be entitled.

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expressed concern that allowing adaptive modulation could result in some links being intentionally designed with reduced fade margins, to obtain a *de facto* exemption from the minimum modulation efficiency (data rates) requirements. EIBASS shares this concern, as experience has shown that if a loophole exists in the Commission's rules, it won't be long until it gets found and exploited.

20. EIBASS therefore agrees with the revised Section 101.141(a)(3) wording suggested by Comsearch at page 19 of its comments: The predicted availability (rain + multipath) for links using Category A antennas should be at least 99.995%, to ensure that paths with intentionally reduced fade margins do not get licensed.

V. Digital Modulation Efficiency

21. The Comsearch comments claimed that broadcasters have *chosen* to not use higher levels of digital modulation.¹² EIBASS feels compelled to point out that there is a huge difference between engineered, point-to-point paths, and ENG paths. ENG operations do not have the benefit of pre-engineered paths using high-gain antennas with typical gains of 40 to 44 dBi; rather, ENG operations must make do with whatever return path is available for the venue in question, which sometimes means resorting to building-bounce paths (sometimes even more than one bounce). For this reason ENG operations must often use more robust 16QAM or even QPSK modulation; the high-level 128QAM digital modulation mentioned by Comsearch is generally impractical for ENG operations. Even coded orthogonal frequency division multiplexing modulation (COFDM) can sometimes be an insufficiently robust digital modulation for the most marginal of ENG paths. Finally, EIBASS notes that in its initial comments, it agreed that the time had come to apply minimum modulation efficiency standards to fixed, point-to-point TV BAS paths, with an exception to accommodate ICR links that serve as backhauls for fixed ENG-RO sites; such ICR stations often only have traffic when relaying an incoming ENG feed, and even then the digital modulation rate may be restricted if the incoming ENG feed had to use a more robust, but lower level of digital modulation.

22. At pages 5 and 6 of its comments, AT&T notes how important backhaul spectrum is to allowing broadband services. EIBASS submits, though, that if one compares the bit rate per subscriber efficiency of streaming video being sent to a wireless handset subscriber to the bit rate per viewer of a TV broadcast signal (*i.e.*, being sent to hundreds of thousands to millions of viewers), the broadcast signal's use of spectrum is more efficient by orders of magnitude.

¹² Comsearch comments, at page 21, footnote 30.

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VI. WSI's Microwave White Spaces/Concurrent Coordination/Auxiliary Microwave Proposals (ET Docket 07-121)

23. Twenty parties filed in opposition to the WSI's various proposals involving "microwave white spaces," "concurrent coordination," "auxiliary microwave stations," and/or WSI's claim that it has developed a physically small, distributed radiating element (DRE) microwave antenna meeting FCC Category A antenna standards. Six parties filed in support. Nine parties, including SBE, offered no opinion regarding the various iterations of WSI's undocumented claims over the last three years. EIBASS agrees with Verizon regarding its identification of the WSI "abuses" of the PCN process.¹³

24. When parties such as the AT&T, the Telecommunications Industry Association (TIA), the Satellite Industry Association (SIA), Rural Telecommunications Group, Inc., the National Spectrum Management Association (NSMA), the Fixed Wireless Communications Coalition (FWCC), and (ahem) EIBASS all tell the Commission that the WSI proposal is technically flawed the Commission should take notice. It bears repeating the quote from Dr. Carl Sagan that EIBASS provided in its ET Docket 07-121 comments: "Extraordinary claims require extraordinary evidence."¹⁴ WSI has had ample opportunities to supply credible documentation for its extraordinary claims, but has failed to do so. The WSI claims are the equivalent of cold fusion for microwave spectrum. The Commission should use this rulemaking to terminate the various WSI schemes once and for all unless WSI finally supplies, in its reply comments to this proceeding, solid technical proof of said claims.

VII. EIBASS Agrees with AT&T: Abolish Full-Band, Full-Arc Protection for Satellite Earth Stations

25. EIBASS agrees with the AT&T comments¹⁵ urging that the Commission abolish the practice of routinely protecting satellite Earth stations for all possible satellite band frequencies and all possible look angles ("full-band, full-arc" protection). EIBASS believes that this FCC policy is inconsistent between supposedly co-equal terrestrial and satellite services and constitutes *de facto* spectrum warehousing. Indeed, in the WT Docket 03-66 rulemaking involving 2.6 GHz Broadband Radio Service (BRS)/Educational Broadband Service (EBS) stations, the Commission stated

¹³ Verizon comments, at pages 16 and 17.

¹⁴ "Encyclopaedia Galactica". Carl Sagan (writer/host). *Cosmos*. PBS, 1980, Chapter 12, at 1:24 minutes in.

¹⁵ AT&T comments, at pages 14–15.

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We note that the Communications Act requires us to adopt policies to deter spectrum warehousing, promote the rapid development and deployment of new technologies and services, and promote service to rural areas." 47 USC (Communications Act), Section 309(j)(4)(B).

26. In IB Docket 00-203, a rulemaking addressing the full-band, full-arc problem, triggered by the May 5, 1999, FWCC request for a declaratory ruling imposing certain operational requirements on fixed-satellite service (FSS) Earth stations in bands that are shared on a co-primary basis with terrestrial fixed service stations, the Commission issued a frustrating (to EIBASS) January 30, 2002, Second R&O. At paragraph 13 the Commission stated

Rather than establishing rules that may not address the concerns raised in this proceeding, and may only substitute one set of concerns for another, we terminate our consideration of these issues in this docket.

In light of the AT&T comments, and also the Comsearch comments¹⁶, noting that the current satellite arc protection rules require a terrestrial microwave station in Boston to protect satellites over Europe and Africa (*i.e.*, geostationary satellites with orbital positions of 3° to 12°E) and over the Pacific Ocean, Hawaii and Alaska (*i.e.*, geostationary satellites with orbital positions of 145° W to 154°W), EIBASS believes that the Commission needs to "un-terminate" this issue and restore balance between supposedly co-primary services.

27. The Commission doesn't allow terrestrial point-to-point microwave applicants to license multiple microwave paths or multiple microwave channels without demonstration of need. Even then the applicant must file an "NT" construction completed notification within 18 months or forfeit its grant. Equity demands that Earth station satellite operations only be protected to the extent such stations can demonstrate an actual need for the look angle to a specific satellite, and for specific channels actually in use. If communications with other satellites or other channels are needed, then FSS Earth stations should have to undertake a new PCN and file for modified facilities, just as fixed-link terrestrial stations must do if they want to add or modify a path, or add or modify frequencies.

VIII. Summary

28. Opening the 7 and 13 GHz TV BAS bands to POFS can only be done if the Commission requires newcomer POFS links to protect all fixed ENG-RO sites in those bands, to a stringent no more than 0.5 dB degradation of the noise threshold of the ENG receiver in use at the fixed

¹⁶ Comsearch comments, at page 32.

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ENG-RO site (in addition, of course, to protecting a existing BAS fixed links of record, just as BAS stations entering a POFS band would have to demonstrate protection of all existing POFS stations of record). The Part 101 protocols applied to most Part 74 fixed-link stations beginning in 2003 have worked reasonably well, and should continue to be used, but the Commission needs to take action to discourage PCN spam. One more opportunity for fixed-link Part 74 licensees to add missing receive-end data, and for 7 and 13 GHz TV Pickup stations to document their fixed ENG-RO receive sites, must first be provided. Finally, the Commission has an opportunity to offer potential relief to both radio and TV BAS licensees by abolishing the Section 101.603(a)(7) no-last-link prohibition.

List of Figures

29. The following figure has been prepared as a part of these WT Docket 10-153 reply comments:

1. Figure showing the TSB-10F coordination keyholes.

Respectfully submitted,

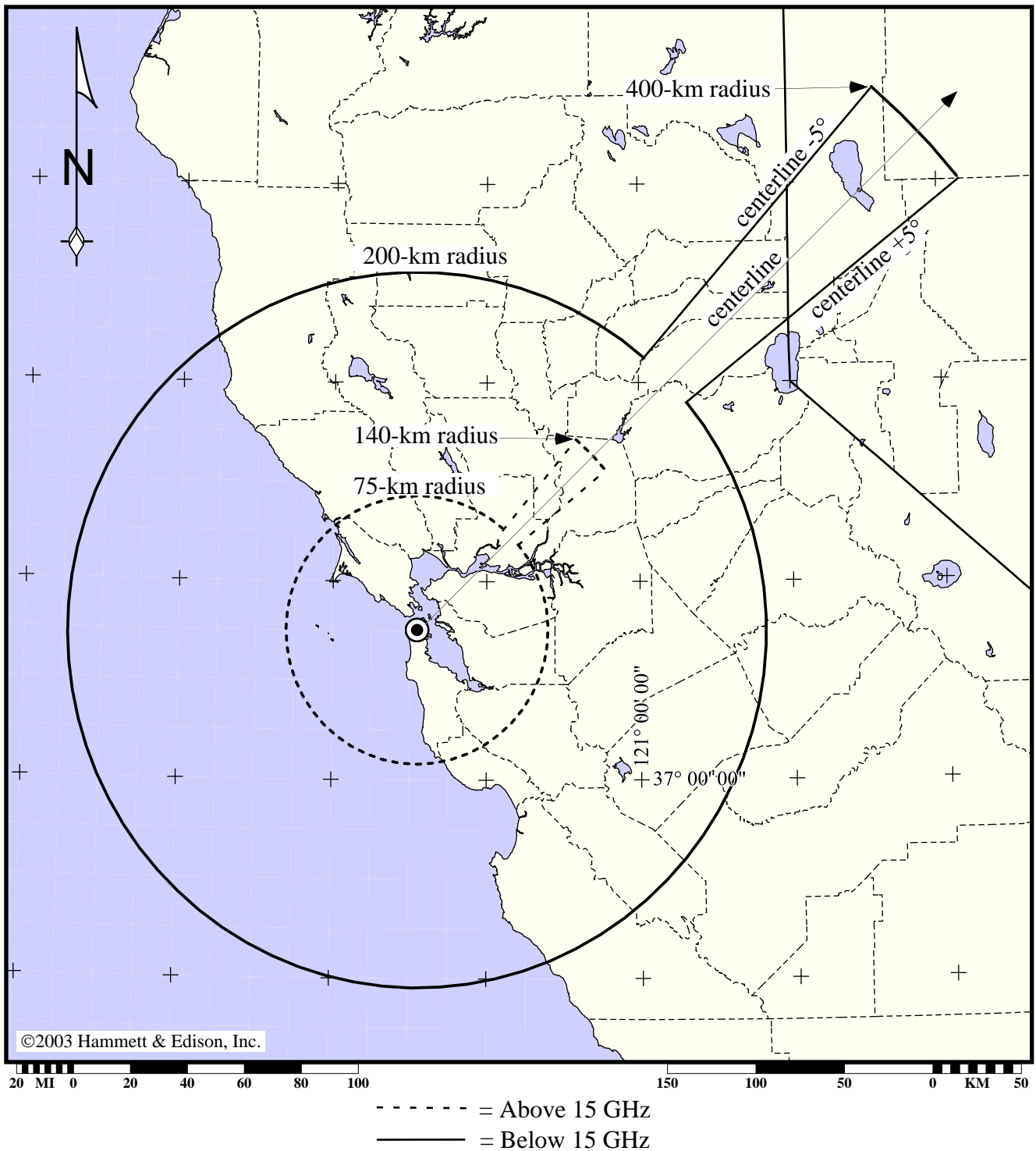
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TIA/EIA TSB10-F Coordination Keyholes
(Section 3.4)



Albers equal area map projection. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey. Geographic coordinate marks shown at 60-minute increments.